Overview of ERA's Advanced Vehicle Concepts NRA

N+2 Advanced Vehicle Concepts &
Quick-Starts NRA Pre-Proposal Meeting
February 19, 2010

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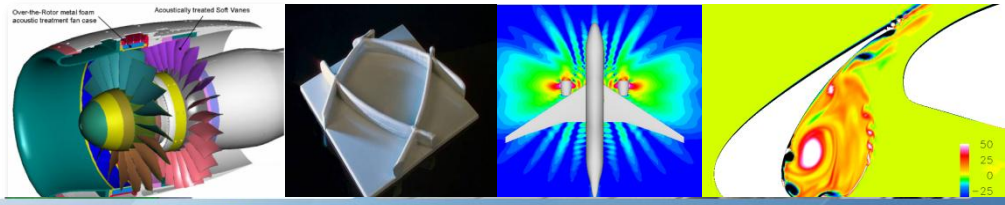


Goals

- For this presentation:
  - To explain what is in the upcoming ERA N+2 Advanced Vehicle Concepts NRA
  - To solicit feedback from the aeronautics community on how to make the draft NRA better
  - To answer questions that pre-proposal meeting participants may have about the NRA
- For the NRA:
  - For Potential Proposers
    - To perform a study that determines aircraft systems (configuration, technologies, and airspace) and a time phased technology development plan, that meet NASA's N+2 subsonic system level metrics (EIS 2025)
  - For NASA's ERA Project
    - To guide research and technology investments in Phase 2 of the ERA project

Objectives of the NRA

- Describe your view of the 2025 NextGen National Airspace System (NAS) environmental challenges and constraints
- Develop a Preferred System Concept (PSC) with variants (2025 EIS) to mitigate challenges and constraints and meet or exceed the N+2 metrics
- Evaluate how your PSC will operate within NextGen NAS
  - Noise profiles
  - LTO & Cruise NOX output
  - Carbon output
  - Operational trajectories
- Develop a time phased Technology Maturation Plans to enable the PSC
  - Quantify beginning and ending TRL (technologies) & SRL (PSC)
  - Prioritize technologies that must be developed in the FY 13-15 timeframe

Programmatic Considerations

- Approximately $9.0M split among 2-3 awards
- Duration: 18 months (~July 2010 thru December 2011)
  - Results feed FY 2012 decision point
- Reporting and Presentation Requirements:
  - Monthly written reports (10 pages, electronic submission)
  - Final report will be published as a NASA Contractor Report (CR)
  - Quarterly oral presentations at a NASA center
  - Final presentation to be at ~15 month mark (at completion of design work)
- Project Kickoff Meeting within 3 months of project start
  - A goal is to foster strategic partnerships between NASA and the awarded institutions for collaborative research and development of innovative concepts and ideas

Proposal Requirements

- Science-Technology-Management section not to exceed 50 pages
- Statement of relevance to the objectives of the solicitation
- Work plan to include a schedule with milestones and measurable metrics
- Include relevant qualifications, capabilities and experience of the lead organization and team members
- Statement of what intellectual property is expected to be publicly available
- Budget to include travel for presentations and face to face meetings with NASA researchers

Evaluation Criteria

- Relevance to NASA's objectives: 20%
- Technical Merit: 35%
- Effectiveness of the proposed work plan: 20%
  - Cost is a factor
  - Intellectual property rights will be negotiated on a case by case basis
- Proposed team qualifications: 25%

Projected Timeline

- March 1, 2010: Final NRA posted
- April 15, 2010: Proposals due (45-day solicitation period)
- May 1, 2010: Selection Complete
- June 30, 2010: Awardees on contract

QUICK-START NRA'S

Quick-Start NRA # 1 – PAI & PAA Testing

- Goal: Study/Demonstrate Propulsion–Airframe Integration and Aero-acoustics of VHBR Installations on Advanced Tube and Wing and Hybrid Wing–Body Configurations

VHBR = open rotor, ducted fan, direct and geared turbo-fan

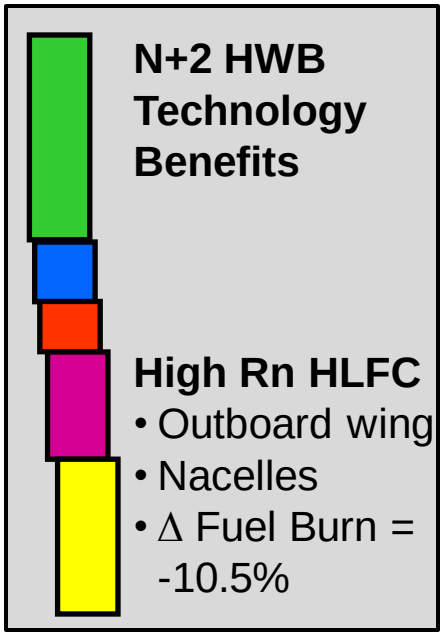
(TRL 6 = 2020, EIS=2025)

Quick-Start NRA #1 - continued

- Develop vehicle configuration and detailed vehicle OML
- Design Transonic and Low Speed WT Experiments
  - Identify preferred wind tunnel(s)
  - Semispan or full span?
  - Power source?
  - Instrumentation?
  - Geometric and Test Parameters?
- Design and Fabricate Model Hardware
- Support wind tunnel test campaign
- Develop an option for a full flight test program
  - Platform options
  - Detailed time line
  - ROM costs (detailed cost estimate)
  - Payoff in terms of our N+2 metrics
  - Potential Partners

Quick-Start NRA #2 - Flight Weight HLFC system

- Goal: Raise the TRL to:
  - Expand database and trade space with regard to cost, weight and performance of flight weight HLFC system
  - Provide confidence to proceed to a highly integrated flight experiment



Quick-Start NRA # 2 – continued

- Design a prototype flight weight HLFC system
  - Long range transport application
  - What design and analysis tools will be used?
  - What gaps exist in design and analysis tools?
  - Integrate with other wing systems
  - Perform rigorous assessment of system integration issues
  - Identify manufacturing and in-service maintenance issues

- Develop an option for a full flight test program
  - Platform options
  - Detailed time line
  - ROM costs (detailed cost estimate)
  - Payoff in terms of our N+2 metrics
  - Potential Partners
  - FY12 an option for risk reduction component demonstrations

NRA Budget

	FY10	FY11
N+2 Advanced Vehicle NRA	$7.6M	$1.4M
Quick start NRA 1: Design, fabrication, and testing of low-speed and transonic VHBR (open rotor, ducted fan, direct & geared turbofan) wind-tunnel models to study community and cruise noise characteristics, acoustic shielding, and aerodynamic integration opportunities	$1.5M	$2.6M
Quick start NRA 2: Design, Development and Test of Flight Weight Hybrid Laminar Flow Control Systems	$0.5M	$3.5M
Total	**$9.6M**	**$7.5M**